



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,859	11/19/2003	Hiromi Sakima	245742US2	5595

22850 7590 05/04/2007  
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
----------

KORNAKOV, MIKHAIL

ART UNIT	PAPER NUMBER
----------	--------------

1746

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

05/04/2007

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

th

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/715,859		SAKIMA, HIROMI	
	<b>Examiner</b>		<b>Art Unit</b>	
	Michael Kornakov		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/19/03</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that **the abstract not exceed 150 words** in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

2. The disclosure is objected to because of the following informalities: page 2, lines 14-15 recite "F/C (fluorine/chlorine) ratio, e.g.  $C_4F_8$ ", which is not readily ascertainable. Page 2, lines 16-17 recite "a CF based **element** such as  $CF_4$ ", which does not correspond to the widely accepted definition of element as a substance composed of only one kind of atom.

Appropriate clarifications/corrections are required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Autryve et al (U.S. 6,014,979.

Van Autryve teaches an apparatus for performing plasma processing, which comprises a chamber 25 for carrying out plasma processing of the substrate; a gas supply system (Fig. 1a) for supplying oxygen (deposit removing gas, as instantly claimed) and CF<sub>4</sub> (dummy substrate etching gas, capable of plasma etching a dummy substrate); a dummy substrate made of silicon (col. 9, lines 17-18). The apparatus of Van Autryve is fully capable of performing the first plasma process and the second plasma process, as claimed. With regard to a ratio of flow rates of gases, applied during the chamber cleaning, as per claim 18 and with regard to a high frequency power, applied during the plasma processing, as per claim 19, it is noted that these limitations do not provide any additional structural element, but recite specific processing parameters established for particular processing and the apparatus of Van Autryve is fully capable of providing and maintaining such parameters. Furthermore, it is well settled that the manner of operating does not differentiate apparatus claim from the prior art if the prior art apparatus teaches all of the structural limitations of the claims, consult *Ex parte Marsham*, 2 USPQ 2-nd 1647 (BPAI 1987). It is also stated that the apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function, consult *In re Danley*, 120 USPQ 528, 531 (CCPA 1959).

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Ma et al (U.S. 20020006674).

Ma teaches a plasma processing method wherein the substrate is etched in the

Art Unit: 1746

plasma processing step, which creates particle build up on the chamber walls, followed by chamber clean process and subsequent plasma processing step(s), wherein the particle build up on the chamber walls is/are not reported. The chamber clean process of Ma includes the use of dummy wafer and the gaseous chemistry including O<sub>2</sub> (deposit removing gas, as claimed) with the small amount of CF<sub>4</sub> (gas capable of etching the dummy substrate, as claimed) (0098, 0099). Therefore, all the processing steps as claimed are met by Ma.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Autryve et al (U.S. 6,014,979).

Van Autryve teaches a plasma processing method, wherein substrate is etched

Art Unit: 1746

with a halogen containing gas, that deposits excessive amounts of polymeric residues on the surface of sacrificial material 90, which is made of quartz and positioned inside the processing chamber around the substrate. After the etching, the substrate is replaced with dummy silicon wafer and the sacrificial material is dry cleaned by supplying into the chamber O<sub>2</sub> gas (deposit removing gas) and CF<sub>4</sub> gas (gas, capable of etching the dummy substrate) (col. 9, lines 3-31). Van Autryve is silent about the second substrate processing step, wherein the deposits are not accumulated in the chamber, however, this step is seemed to be immaterial to the inside chamber cleaning process, since no deposits are produced in this step and therefore the presence/absence of this step does not materially affects the inside chamber cleanness.

9. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al (U.S. 20020006674).

The teaching of Ma is discussed above. With regard to claim 5, Ma does not specifically indicate that a dummy wafer is made of material having silicon. However, dummy silicon wafer are conventionally utilized in the art and one skilled in the art would have found obvious to use silicon wafer as dummy wafer in the teaching of Ma with the reasonable expectation of success. The same rationale is applied to the limitation of claim 11.

Ma does not specifically indicate a ratio of flow rate of CF<sub>4</sub> to that of O<sub>2</sub> as recited in claim 6. However, Ma teaches the use of gaseous chemistry including O<sub>2</sub> (deposit removing gas, as claimed) with the **small amount** of CF<sub>4</sub> (gas capable of etching the

Art Unit: 1746

dummy substrate, as claimed). Since particular content of the gaseous mixture depends on the chemical composition of the residue deposited on the chamber surfaces, thus being result effective, one skilled in the art would have found obvious to optimize the composition of the gaseous mixture of Ma in order to completely remove the build up on the chamber walls in the teaching of Ma. It is also noted that discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious, consult *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980). With regard to claim 7, Ma does not specifically indicate application a high frequency power to one of a top and a bottom electrode. However, Ma teaches the use of standard plasma processing equipment. It is noted that either a top or a bottom electrode are conventionally used in such equipment for application of power and the presence of such electrodes is reasonably expected within the teaching of Ma. As to the specific parameter of high frequency power, as per claim 7, it is within the skills of the ordinary skilled in the art to find and utilize the optimum power range in order to obtain optimum cleaning result in the teaching of Ma.

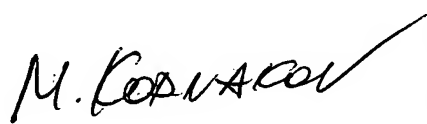
### ***Election/Restrictions***

10. Applicant's arguments with regard to restriction requirement are found persuasive and the restriction requirement is currently withdrawn, however, it may be imposed later if the claims are amended to introduce additional limitations to either method or apparatus claims, which would require additional search.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael Kornakov  
Primary Examiner  
Art Unit 1746

04/27/2007